Invited Commentary

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Industrialized foods in early infancy: a growing need of nutritional research

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A systematic analysis for the global burden of disease study assessing data from 195 countries, identified high intake of sodium, and low intake of whole grains, fruit, vegetables, nuts, and seeds as the main dietary risks factors for deaths and disability-adjusted life-years.[1] In this global overview, consumption of nearly all healthy foods such as fruit, vegetables, and legumes, was suboptimal, whereas the consumption of sugar-sweetened beverages was far higher than the optimal intake. High consumption of red meat, processed meat, and trans-fat were also toward the bottom when ranking the dietary risks for deaths and disability-adjusted life-years for most high-population countries.[1] These findings require an urgent need to implement healthy eating patterns[2] as soon as possible during the early windows of opportunity for preventing noncommunicable diseases (NCDs) such as the complementary feeding period and the early infancy.[3] During these life stages, commercially produced infant foods may be particularly used, and many of them are also industrialized. At the present time, there is a complex and controversial debate about the role of food processing as the primary driver of diet quality.[4] In general, food processing implies changing raw commodities into ingredients or food substances, after some changes that may be physical, chemical, or microbiological, for example, and the main goals of these transformations may include expanding shelf life, increasing nutritional quality, attending special nutritional requirements, or adding variety and convenience.[5] Although many industrialized healthful foods are minimal processed, such as fruits, vegetables, nuts, legumes, or eggs, the specific category of ultraprocessed foods has been studied in relation to diet adequacy and to risk factors for NCDs. Monteiro et al[4,6–8] proposed that the main shaping force of the global food system and the main determinant of poor diets and their related influences on obesity and diet related NCDs was "food processing." The definitions of ultra-processed foods have been changing and showed variability particularly in the last 10 years.[4] More recently, Monteiro et al[9,10] defined ultraprocessed foods in NOVA classification as industrial formulations of several ingredients which, besides salt, sugar, oils and fats, include food substances not commonly used in culinary preparations, such as hydrolysed protein, modified starches, and hydrogenated or interesterified oils, or additives whose purpose is to imitate sensorial qualities of unprocessed or minimally processed foods and their culinary preparations or to disguise undesirable qualities of the final product, such as colorants, flavorings, nonsugar sweeteners, emulsifiers, humectants, sequestrants, and firming, bulking, defoaming, anticaking, and glazing agents.

The contribution of ultraprocessed foods to energy intake of populations in the higher quintiles of intake may vary from 49% in Brazil, to 76% in Canada, 78% in the UK, and 81% in the USA; in Mediterranean countries highly processed foods may contribute with 70% of the energy, and 50% to 90% of the nutrients intake in Nordic/Central Europe (with the exceptions of vitamin C and beta-carotene).[4] However, the contribution of processed and ultra-processed foods in children is also referred as a factor that may decrease the quality of diet in children considering that many foods exhibit unhealthy nutrient profiles, with higher amounts of sugar, *trans* fat, and sodium, compared with unprocessed or minimally processed foods; furthermore, after adjustment for energy intake, they may provide lower amounts of zinc, calcium, and vitamins A, B12, C, and E.[11] In infants and young children from Canada, 63% of the food products sold in Canada were reported as having high levels of sodium or sugar contribution to energy content,[12] and in Brazil, the analysis of 2945 processed foods that are usually consumed as snacks by children showed that 21% presented high levels of sodium.[13] Maalouf et al[14] assessed the sodium, sugar, and fat content of complementary infant and toddler foods sold in USA, and most commercial toddler meals, cereal bars and breakfast pastries, and infant-toddler snacks and desserts have high sodium contents or contain added sugars, suggesting a need for continued public health efforts to support families implementing healthy eating strategies.

The described nutritional characteristics of these products are particularly important considering that (1) nutritional guidelines recommend to limit the intake of added sugars,[15] particularly before 2 years of age,[16] sodium,[17] and saturated and *trans*-fat and (2) habitual diets of children aged 1 to 3 years across different parts of the world may exceed sodium[18] or the energy contribution from sugar and saturated fat.[19–22]

Bearing in mind this global health and dietary intake scenarios, it is important to assess across different nations, including those facing a nutrition transition and developed countries, information on the nutritional profiles, and food processing characteristics of industrialized foods and beverages that are specifically labeled for infants, toddlers, and children younger than 3 years, and to help parents and health professionals with the right information in choosing complementary and baby foods in this biological window of opportunity to prevent NCDs. Furthermore, data collection on industrialized baby foods will be useful to monitor nutritional composition, to assess the eventual need of product nutritional reformulation or other measures of quality control, such as consumer-friendly labeling or nutrient profiling tools, and to evaluate the impact of any future strategies aiming to improve industrialized foods for children.

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